

What is claimed is:

1. A movable barrier operator operable from alternating current comprising:  
an electric motor;  
5 a transmission connected to the motor to be driven thereby and to the movable barrier to be moved;  
an electric circuit for detecting AC line voltage and frequency of the alternating current;  
a worklight;  
10 a first set of operational values for operating the worklight, when a first AC line frequency is detected;  
a second set of operational values for operating the worklight, when a second AC line frequency is detected;  
and  
15 a controller, responsive to the detected AC line frequency, for activating the corresponding operational set of values for operating the worklight.
2. A movable barrier operator operable from alternating current according to claim 1 wherein the  
20 first AC line frequency comprises 50 Hz and the first set of values comprises a first shut-off time and the second AC line frequency comprises 60 Hz and the second set of values comprises a second shut-off time.
3. A movable barrier operator operable from alternating current according to claim 2 further  
25 comprising a routine for controlling motor speed and wherein the first set of values further comprises a scaling factor for scaling the motor speed.
4. A movable barrier operator operable from alternating current according to claim 3 wherein the  
30 scaling factor is stored in a look-up table stored in a memory.

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5. A movable barrier operator operable from alternating current according to claim 2 wherein the first shut-off time comprises about two and one half minutes and wherein the second shut-off time comprises about four and one half minutes.

6. A movable barrier operator having linearly variable output speed, comprising:  
an electric motor having a motor output shaft;  
a transmission connected to the motor output shaft  
to be driven thereby and to the movable barrier to be moved;  
a circuit for providing a pulse signal comprising a series of pulses;  
a motor control circuit responsive to the pulse signal, for starting the motor and for determining the direction of rotation of the motor output shaft; and  
a controller for controlling the length of the pulses in the pulse signal in accordance with a predetermined set of values, wherein in accordance with the predetermined set of values, a speed of the motor is linearly varied from zero to a maximum speed and from the maximum speed to zero.

7. A movable barrier operator according to claim 6 wherein the predetermined set of values causes incrementing of the motor speed from zero to a maximum motor speed in a plurality of steps, causing the motor to operate at the maximum speed for a predetermined period of time, then decrementing the motor speed from the maximum speed to zero in a plurality of steps.

8. A movable barrier operator according to claim 7 wherein each step comprises a value corresponding to about five percent of a maximum speed of the motor.

9. A moveable barrier operator according to claim 6 wherein the motor control circuit comprises:

a first electromechanical switch for causing the motor output shaft to rotate in a first direction;

5 a second electromechanical switch for causing the motor output shaft to rotate in a second direction; and

a solid state device responsive to the pulse signal, for providing current to the motor to cause it to rotate.

10. A movable barrier operator according to claim 9  
10 wherein the first and second electromechanical switches comprise relays and the solid state device comprises an FET.

11. A movable barrier operator which automatically detects barrier size, comprising:

15 an electric motor having a maximum output speed;

a transmission connected to the motor to be driven thereby and to the movable barrier to be moved;

a position detector for sensing the position of the barrier with respect to a frame of reference; and

20 a controller, responsive to the position detector, for calculating a time of travel between a first barrier travel limit and a second barrier travel limit and responsive to the calculated time of barrier travel, for automatically adjusting a barrier travel speed.

25 12. A movable barrier operator according to claim 11 wherein the barrier comprises a segmented panel door and wherein the controller adjusts the barrier travel speed such that a maximum barrier travel speed is based on one hundred percent of the motor's maximum output  
30 speed.

13. A movable barrier operator according to claim 11 wherein the barrier comprises a single panel door and

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wherein the controller adjusts the barrier travel speed such that a maximum barrier travel speed is based on percentage less than one hundred percent of the motor's maximum output speed.

5           14. A movable barrier operator according to claim  
12 further comprising a routine for varying the motor  
speed in accordance with a predetermined set of values,  
wherein in accordance with the predetermined set of  
values, a speed of the motor is linearly varied from zero  
10 to a maximum speed and from the maximum speed to zero.

15           15. A movable barrier operator according to claim  
13 further comprising a routine for varying the motor  
speed in accordance with a predetermined set of values,  
wherein in accordance with the predetermined set of  
values, a speed of the motor speed is linearly varied  
from zero to the motor's scaled output speed and from the  
motor's scaled output speed to zero.

20           16. A movable barrier operator having full closure,  
comprising:  
an electric motor;  
a transmission connected to the motor to be driven  
thereby and connectable to a movable barrier to be moved;  
a position detector for sensing a position of the  
barrier;  
25 a learn routine for determining a minimum reversal  
position of the barrier relative to a close limit,  
wherein the minimum reversal position of the barrier  
position is located a short distance above the close  
limit;  
30 a controller responsive to the position detector and  
to a close command to move the barrier to the close  
limit, for controlling the motor, wherein when the  
position detector senses the position of the barrier at

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5            17. A movable barrier operator according to claim  
16 wherein the electric motor comprises a DC motor.

19. A movable barrier operator according to claim  
10 16 wherein the minimum reversal position is located  
approximately one inch above the close limit.

15            21. A movable barrier operator having automatic  
force settings, comprising:

a circuit for providing a pulse signal comprising a series of pulses;

a first force command device for setting a first force limit for use when the motor is rotating in a first direction;

30 a second force command device for setting a second  
force limit for use when the motor is rotating in a  
second direction; and

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30. A movable barrier operator according to claim 27, wherein the flasher routine continues only during the predetermined delay period.

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